Space Weather Forecast

Issued on Sunday, 12 March 2023 at 01:10 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of isolated Moderate class flares (R1-R2/Minor-Moderate radio blackouts) throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low, with only Common-class flares. The largest from a moderately large bipolar region in the southwest quadrant. There are currently ten sunspot regions on the visible disc, with the majority small, magnetically simple, and either stable or slowly evolving. A coronal mass ejection (CME) associated with a filament eruption (arc of plasma) was observed lifting off the southwest quadrant of the Sun on the 10th March. This has been analysed and may give Earth a glancing blow either late day 3 (14 Mar) or early day 4 (15 March). Another filament eruption (arc of plasma) was observed lifting off the southwest disc at 11/1648UTC, which produced a CME. This has been analysed for any Earth-directed component, although currently awaiting the results. No other Earth-directed CMEs have been observed in coronagraph imagery.

Solar Wind / Geomagnetic Activity: The solar wind speed has shown a steady declining from slightly elevated to near background levels. Total magnetic field strength was weak. The important north-south component also varied weakly. Geomagnetic activity was Quiet to Unsettled (Kp 0-3).

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is likely to remain generally Low. But with the number of active regions on the disc there remains a chance of an isolated Moderate-class flares, perhaps most likely from two moderately large regions in the southern hemisphere.

Solar Wind / Geomagnetic Activity: Solar winds are expected to be at mainly background levels over the coming days, with no further coronal hole fast winds to give appreciable enhancements. The next enhancement is likely to be late on day 4 (15 Mar) with a fast wind from coronal hole 84, with speeds likely to reach around 500km/s. Geomagnetic activity is likely to be mostly Quiet to Unsettled (Kp 0-3) throughout the period, with a slight chance of Active intervals, due to a possible glancing blow from a CME (on either the 14 or 15 March) and the arrival of the next coronal hole fast wind by the end of the period.

Energetic Particles / Solar Radiation: Solar radiation levels are most likely to stay at background levels, with a slight chance of reaching the S1/Minor Storm threshold or greater should any larger flares occur.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	5	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	25	25	25	25
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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